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SCIENCE AND HUMAN AFFAIRS

Centre for Interdisciplinary Studies

Sir George Williams Campus

COURSE GUIDE

1976-77

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This course guide has been prepared months in advance of the 1976-77 academic year and information contained herein is subject to change.

Students are advised not to purchase any texts without the approval of the department or professor concerned.

A society that blindly accepts the decisions of experts is a sick society on its way to death. The time has come when we must produce, alongside specialists, another class of scholars and citizens who have broad familiarity with the facts, methods and objectives of science and are thus capable of making judgements about scientific policies. Persons who work at the interface of science and society have become essential simply because almost everything that happens in society is influenced by science.

René Dubos.

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SCIENCE AND HUMAN AFFAIRS

The Programme

This programme is concerned with the social dimensions of science and technology. Its teaching and research provide an interdisciplinary examination of the ethical, cultural, political and environmental problems associated with scientific and technological change. Attention is also focused on analysis of the social systems of science from historical, sociological, economic and philosophical perspectives.

The programme is designed for students interested in science and technology, but who do not plan careers in scientific research or the technical professions. Rather it prepares them for constructive careers which involve a grasp of scientific methods, an understanding of scientific principles, and an appreciation of the nature, content and implications of scientific research, technological innovation and industrial development. For students working toward degrees in science or engineering, the programme provides the opportunity to develop important additional perspectives and capabilities.

There are a number of streams or areas within the programme. In the History and Philosophy of Science, for example, students may concentrate so as to prepare themselves for graduate work. Another stream examines the social impact of science and technology by focusing on policy problems. Students may develop a variety of approaches for dealing with public policy in either the areas of science and technology or environment. These also are preparatory for existing graduate programmes.

In addition to courses in Science and Human Affairs, Concordia offers related courses in many other departments, a major and minor in Environmental Biology, Social Aspects of Engineering and a minor in Social Responsibility of Science on the Loyola Campus.

Need For Such A Programme

The social dimensions of science and technology are critically important for at least three reasons. First, the human, physical and financial resources that society has allocated to science and technology have increased enormously. This has led to a growing concern that decisions on the expenditure of these resources be made wisely. Numerous attempts are being made to develop criteria against which to judge the allocation of resources to science and technology. To do this requires an understanding of the nature and causes of scientific and technological growth.

A second reason is the growing realization that science and technology are deeply implicated in what are becoming recognized as pressing human and social problems. The contributions that science and technology have made to improving the human condition are clear. What is less clear, and has only recently been recognized, are the secondary or hidden costs of scientific and technological development. The most fundamental issues of our time - pollution of the environment, resource depletion, overpopulation, weapons of mass destruction, technological unemployment, alienation - have a scientific or technological base. Clearly these problems require urgent attention through new types of conceptual and methodological analyses.

Thirdly, the scientific and technological system in terms of its sheer size and its dependence upon skilled elites who alone possess the necessary knowledge and understanding, presents many disturbing challenges to any concept of popular or democratic control.

These three factors - the sheer size of the system, the direct involvement of the system in a number of pressing social problems and the fundamental acceptance of power which derives directly from specialized knowledge - provide the basis for the creation of the Science and Human Affairs Programme.

Finally, there has always been at the Sir George campus of Concordia, a commitment to innovative university education and programmes that relate to active social and community concerns.

Science and Human Affairs Committee

GEORGE BINDON, Science and Human Affairs, Coordinator
GORDON CADENHEAD, Science and Human Affairs
DAVID WADE CHAMBERS, History/Science and Human Affairs
JEFFREY CRELINSTEN, Social Responsibility in Science (Loyola Campus)
FREDERICK KNELMAN, Science and Human Affairs
HERBERT ODOM, Science and Human Affairs
ROGER ANGEL, Philosophy
DAVID CHARLTON, Physics
HUGH McQUEEN, Engineering

MAJOR AND MINOR REQUIREMENTS

BA MAJOR IN SCIENCE AND HUMAN AFFAIRS

Note: Asterisk means a three credit course

12 Sc & Hum Aff N-201*, N-202*, N-221*, N-222*

6 Sc & Hum Aff N-312, N-351
Int. St. N-212, N-333 or
Sc Elec approved by the Centre

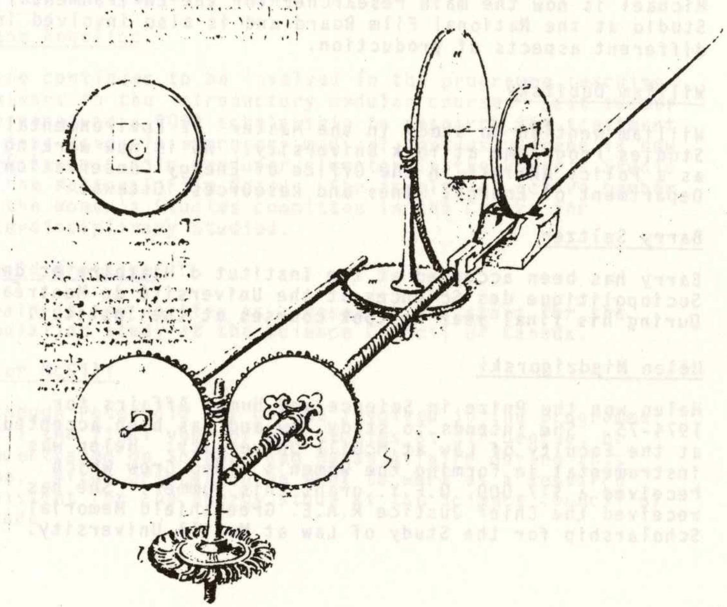
18 Sc & Hum Aff N-401, N-446, N-447, N-472,
Phil N-421, N-376*, N-421, Rel N-443
Soc N-422, Hist N-333, or
Elec approved by the Centre

6 Sc & Hum Aff N-493

Minor in Science and Human Affairs

12 Sc & Hum Aff N-201*, N-202*, N-221*, N-222*

18 Sc & Hum Aff N-312, N-351, N-401, N-446,
N-447, N-472



Students

For students who are particularly interested in the concerns of the programme there are many opportunities to develop individual or tutorial relationships with members of the staff. In addition, students who have exhibited special merit may enroll as student teachers for partial course credit. Activities outside the university, relevant to the academic interests of the programme, are recognized and encouraged.

The Science and Human Affairs Student Society plays an important role in departmental decision-making and is active in organizing lectures, seminars, and media presentations.

Below Is An Account Of The Activities Of A Few Graduates

Michael Bryans

Michael received the Prize in Science and Human Affairs upon graduation. While in the programme he took a generalist approach rather than concentrating on one area. Michael is now the main researcher for the Environmental Studio at the National Film Board and is also involved in different aspects of production.

William Dubitsky

William went on to study in the Master of Environmental Studies Programme at York University. He is now working as a Policy Analyst in the Office of Energy Conservation, Department of Energy, Mines and Resources, Ottawa.

Barry Seltzer

Barry has been accepted at the Institut d'Histoire et de Sociopolitique des Sciences at the Université de Montréal. During his final year he took courses at the Institut.

Helen Międzigorski

Helen won the Prize in Science and Human Affairs for 1974-75. She intends to study law and has been accepted at the Faculty of Law at McGill University. Helen was instrumental in forming the Women's Video Crew which received a $17,000 O.F.Y. grant this summer. She has received the Chief Justice R.A.E. Greenshield Memorial Scholarship for the Study of Law at McGill University.

Sitoo Mukerji

He has been accepted in the Master in Environmental Studies Programme at York and the Institut d'Histoire et de Sociopolitique des Sciences at the Université de Montréal. Both of these graduate schools offered financial support and he also won a $4,000 Bourse de Maîtresse from the Québec government. Sitoo is particularly interested in problems of appropriate technology, technology transfer and environmental policy for developing countries.

Mary Stockwell

Mary Stockwell graduated with a joint major in Education and Science and Human Affairs. She has been accepted at the University of Toronto in History and Philosophy of Science and Technology Programme.

Margaret Osborne

Although not a major in Science and Human Affairs, Margaret was active in STOP (Society to Overcome Pollution) and worked as a Research Assistant in our programme . After graduation she went on to the Masters in Environmental Studies programme at York.

Irene Angelico

Irene continues to be involved in the programme teaching seminars in the introductory modular course. Last summer she received a RODA scholarship to research the treatment of drug users in emergency medical centres. Irene is now working as a film producer-director in the Women's Studio at the National Film Board. She is also an active member of the Women's Studies committee in the Centre for Interdisciplinary Studies.

Donald Armitage

Donald is now working as a Research Assistant for the population study at the Science Council of Canada.

Peter McGill

Although Peter did not become involved in the programme until the final year of his studies at Sir George, he concentrated on Science and Human Affairs during this time. After graduation he went to work as a Research Assistant for the energy study at the Science Council of Canada.

Glenn Morton

Glenn is a teacher who took his degree in the evening and graduated with a major in Science and Human Affairs. With assistance from the programme he has organized a team of public and high school teachers who are developing and testing curriculum designs dealing with future studies.

Rubin Vineberg

Rubin graduated with a major in Science and Human Affairs and has been accepted at a number of schools of Library Science.

George Mihalka

After graduating with a major in Science and Human Affairs, George entered the Masters in Educational Technology Programme at Concordia. He is now working as a film maker.

Peter Supino

After graduating, Peter went to York University at Toronto to study film making. He is now working free lance and has produced some humorous shorts for the Best of the New York Erotic Film Festival.

STUDENT EMPLOYMENT

Each year a limited number of students have had the opportunity to work part time during the school terms or full time during the summer on research projects relevant to their course of study. This past summer saw students funded to assist in research dealing with environmental health in Canada, the treatment of drug care facilities, and Canadian nuclear policy.

UNDERGRADUATE SCHOLARS PROGRAMME

The Undergraduate Scholars Programme of the Sir George Williams Campus Faculty of Arts permits a restricted number of responsible students of high academic ability to pursue individually tailored programmes of study leading to the Bachelor of Arts degree with a major or honours in an area of specialization. The programme is planned through consultation between the scholar and his faculty advisor. As many as 54 of the 90 credits required for the degree may be comprised of tutorials. Such tutorials might take the form of guided independent study, or independent field or laboratory research; their precise nature will depend upon the scholar's educational goals, interests and area of specialization.

Below are short descriptions of the U.S.P. Programmes completed by two students in Science and Human Affairs.

David McCallum

David designed his Undergraduate Scholars Programme to focus on the societal impact of information systems and technology. It consists of three inter-relating parts: The Science and Human Affairs Major, courses on methodology and research skills, and regular and U.S.P. courses on selected topics in information study.

The regular courses include selections from Science and Human Affairs, Computer Science, Mathematics, Quantitative Methods, Economics, Management, Education, English and Engineering. The U.S.P. courses (6 credits each) were entitled: Science, Information and Society; Technology and Organizational Communications, and Systems and Society.

He plans to do graduate study into the informational problems of putting theoretical insight to practical advantage. His preparation for this work is considered to be excellent.

Barry Sookman

The main focus of this student's programme was urban environment, and it was felt that the Undergraduate Scholars Porgramme was the most fruitful way of combining Urban Studies and Science and Human Affairs. The programme was therefore partly structured around the principles of familiarization with the general body of theory and literature in environmental studies and the acquisition of useful analytical tools for dealing with environmental problems. These aspects provided a firm basis and context for the study of the special problems of urban environment.

Regular courses were chosen from relevant offerings in Interdisciplinary Studies, Economics, Geography, Political Science. The U.S.P. components involved field work in solid waste management and environment; urban and applied urban geography; and the economics of the environment. Special seminars were also used to integrate all the material.

This programme lays the foundation for the student's projected graduate work in a special programme leading to a double Master's degree in law and the advanced study of urban environment.

IMPORTANT

Students are advised to consult with the staff of the Science and Human Affairs Programme before registration. Individual courses of study can be significantly strengthened by proper structuring of both the major and minor in Science and Human Affairs and other credits taken for the degree.

Major and minor students are encouraged to provide themselves with effective academic and research skills and special strengths in another discipline and/or some particular area of concern within the Science and Human Affairs Programme. Basic university level research and writing skills are prerequisites to successful work in our programme. If you have any doubts about your abilities in these areas you should enroll in one of the writing courses offered by the English Department. Students in an Interdisciplinary Programme are also encouraged to acquire analytical tools through exposure to appropriate disciplinary courses or selected methodology courses. Finally, the serious student should identify an area of particular interest and undertake to develop special competence within the Science and Human Affairs Programme.

TEACHING

The Introductory Courses

From the first the department adopted many innovative pedagogical procedures. Our student constituency is large and very heterogenous, a situation which demands instructional flexibility. The interdisciplinary subject matter calls for teaching methods that ensure coherence, minimize redundancy and promote close cooperation with traditional academic departments. Moreover, the stress which Concordia places on community service leads us to focus the curriculum on recognized social needs and current social problems.

As a direct result of the department's efforts to meet these challenges, we believe teaching has become more vigorous, imaginative, and effective. We make no claim that all changes are improvements on the lecture-exam system. Some innovations have not been successful: others require too large an investment of time and energy. But most have received favourable comment from students and faculty. Delegations from across North America have traveled to Montreal to see our course in action.

One of the programme's most radical departures from standard course format are incorporated in the large introductory survey courses Introduction to Science and Human Affairs I and II and Environmental Issues I and II.

The Modular Approach

The content of the introductory courses are organized into autonomous self-study units. The "modular" approach provides a remarkable degree of flexibility for both students and faculty. Furthermore, it promotes greater, not less, personal interaction between student and professor, while at the same time obliging the student to assume more responsibility for developing his own programme of learning. Most importantly, because it permits many different kinds of faculty participation it has proven to be an effective mechanism for interdisciplinary teaching at the introductory level.

Instead of merely stringing together a series of lectures from a variety of disciplines, a course coordinator is challenged to achieve a more realistic integration of the material. For example, a team of scholars may be organized to produce a modular study unit focusing on a problem that cuts across traditional disciplinary lines. Alternatively, these scholars may form a panel of "resource persons" to advise student groups undertaking advanced projects. Of course, these methods can be used in any academic programme, but the flexibility of modular format encourages the re-thinking of teaching methodology, which is often neglected in interdisciplinary courses.

1. MODULE READINGS

A module is an autonomous self-study unit which a student follows at her/his own pace. You choose which modules you would like to study, decide when you would like to do them, and write a review when you think you are prepared. Modular study is not so much "free" as it is "choiceful".

2. SEMINARS AND ADVANCED PROJECTS

Seminars are short courses of about eight to ten weeks in duration. Most of the seminars are led by staff from the programme or outside people brought in to organize one group. In some cases they take the form of autonomous discussion groups which are essentially student run seminars or perhaps simply an indication by individuals that they are interested in working with a few students on a specific topic. Also included are formal courses offered elsewhere in which the staff person responsible has indicated an interest in having a few of our students attend.

ADVANCED PROJECTS

Seminars, although very convenient for advanced work are not the only method. Students may find that their line of interest is not conducive to a major seminar approach, or they may not be interested in any of the seminars being offered at a time convenient for them to attend. In such cases, there are many other types of projects which may be undertaken.

Advanced projects are limited only to the imagination and resourcefulness of the students, the resources available, and the staff's demands for quality. The best procedure is to work on advanced projects while working on modules. Projects are long-term and should not wait until the module work is completed - this will not leave enough time for a well-developed project.

COURSES OFFERED BY THE SCIENCE AND HUMAN AFFAIRS PROGRAMME

INTRODUCTION TO SCIENCE AND HUMAN AFFAIRS I

Interdisciplinary Studies N-201.2 - 3 credits

INTRODUCTION TO SCIENCE AND HUMAN AFFAIRS II

Interdisciplinary Studies N-202.4 - 3 credits

These courses deal with the social and historical context of scientific and technological changes. Attention is also focused on theoretical analysis of the internal social systems of science from historical, philosophical and socio-political perspectives.

The course material is organized under three broad categories: Science, Technology, and Biology.

SCIENCE:

The Method and Meaning of Science; The Scientific Community; The Growth of Science; The Two Cultures; Science and Ideology; Scientific Responsibility; The Psychology of Science; The Scientific Revolutions; Science and Religion; Darwin; Medieval Technology and Social Change; Science and Public Policy.

TECHNOLOGY:

The Technological Order; Computers and Society; Technology and the City; Technology and War; Technology and Alienation; Technology and Media; Technology Forecasting.

Biology:

Biological Engineering; Drugs and Society; Medical Priorities and Policy; Sex and Society; Race and Society.

COURSE FORMAT

Those unfamiliar with modular learning should read the explanation on pages 10,11

INSTRUCTOR

Contributing to these courses is the responsibility of all the staff in the Science and Human Affairs Programme, as well as outside people who contract to participate as advisors and seminar leaders. The overall coordinator is George Bindon.

Below Are Descriptions Of Some Of The Seminars Offered Last Year

SOCIAL STUDIES IN SCIENCE AND HUMAN AFFAIRS, AN INTRODUCTION

Instructor: Gordon Cadenhead

Content: (1) The principal areas and sub-areas of present study within Science and Human Affairs will be discussed. Those concerns identified by philosophers, historians and scientists involved with the social analysis of science and technology will be examined. (2) The methodologies and approaches that can be most usefully applied in terms of study and teaching will be dealt with.

Requirements: Students will carry out a certain number of short research exercises related to a given amount of preliminary reading and class discussion. A review of each exercise will be held in the following week. The final exercise will be for the student to design a small project of his or her own.

SEMINAR ON THE SOCIAL IMPACT OF TECHNOLOGY

Instructor: Fred Knelman

Content: This seminar will deal with the social role and impact of technology in modern society. Science and technology as social institutions will be examined in terms of their socio-political context and their social and environmental impacts. Ethical problems associated with technological change, technology and economic growth, technology and social policy and certain case studies of selected technologies will be examined.

FROM MAGIC TO SCIENCE

Instructor: Herbert Odom

Content: The origins of modern science in the 16th and 17th Centuries were intertwined with magic and occultism. Some scientists thought of themselves as magicians; others were passionate opponents of magic. In recent years, we have learned many surprising things about the relationship between magic and science, and we shall consider other aspects of science and magic down to the present day.

Requirements: The seminar will consist of class discussions and student reports. Readings will be available in the bookstores, in the library, and in the form of mimeographed handouts. Students will give oral reports on their readings, as well as occasionally submitting short written reports.

SCIENCE AND POLITICS

Instructor: George Bindon

Content: This seminar will discuss the impacts of science and technology on modern political systems. Some of the fundamental issues facing government will be examined in terms of their scientific and technological bases. The relationships between the scientific community and its activities, and government policy-making will be touched upon.

Requirements: Contribution to discussions in the seminar. Readings. A project chosen by the student in consultation with the instructor.

SOCIAL STUDIES IN CANADIAN SCIENCE AND TECHNOLOGY

Instructor: Gordon Cadenhead

Content: As the social analysis of science and technology has gained strength and momentum in response to dire problems so has the importance of understanding "local" variations of science and technology. The need to provide models on which to build for a more socially useful science has been better grasped. In America, Russia, Britain, Europe, China and the Third World, detailed smaller scale social studies (as opposed to larger scale socio-economic studies) of science and technology have been done. Canadian studies are less well known and when done have been usually subsumed under "international" science, which is essentially an American model.

This seminar then, will attempt to create a useful bibliography of social studies in Canadian science and technology, to single out in more detail what are the latter's characteristic aspects, to suggest what are the proper directions of pursuit for future studies.

Requirements: This will be a library research exercise with students assigned to particular sections or sub-sections of the research. Group review meetings will be held to assess progress.

TECHNOLOGY ASSESSMENT SEMINAR

Instructor: Philip Feldman

Content: Technology assessment is a systematical identification, analysis and evaluation of the real and potential impacts of the uses of technology on the social, economical, environmental and political system. It is concerned particularly with the 2nd and 3rd order impacts of the technological developments whether they are planned, unplanned, beneficial or harmful secondary impacts.

The scope of activities that are included in this definition is broad and requires an input from a wide range of disciplines. The subject matter has received widespread attention internationally and Canadian research has taken place as well in recent years.

This seminar describes the topic generally and then reviews the following aspects of the technology assessment: (1) Technological forecasts and technology assessment; (2) International trends; (3) Canadian technology assessment activities; (4) The role of government; (5) The role of industry; (6) Institutional issues; (7) Drawbacks and doubts; (8) Methodologists and technology assessment; (9) Recent case studies.

The seminar will make use of government reports, general papers and other materials. No formal textbook is assigned since one has not yet become available that gives either a Canadian perspective or a generally acceptable view of the subject. Case studies and guest lecturers who have expertise in the area will also be used if possible.

SCIENCE, TECHNOLOGY AND DEVELOPMENT

Instructor: George Bindon

Content: The significance of science and technology in determining the nature of economic development will be discussed. The modern multinational corporation will be examined in terms of its contribution to the transfer of technology from one area to another, and its positive and negative impacts on development patterns. We will look at the nature of scientific and technological activity and the dependence on imported technology in Canada.

Requirements: Contributions to discussions in the seminar. Readings. A project chosen by the student in consultation with the instructor.

ENVIRONMENTAL ISSUES I

Interdisciplinary Studies N-221.2 - 3 credits

ENVIRONMENTAL ISSUES II

Interdisciplinary Studies N-222.4 - 3 credits

This is a modular programme based on several book modules covering various aspects of environmental issues. While the books cover nearly the full spectrum of these issues, the major thematic thrust is the social ecology of systems i.e. cities, regions, nation states and global problems. The books thus deal with the analysis of the politics, economics, technology and culture of these systems in terms of environmental impacts and ecological principles.

Some of the major themes in these books concern:

1) the "limits to growth" debate.
2) the population issues.
3) conflicts between economics and ecology
4) the concept of slow or no growth societies.
5) soft technology.
6) culture, community and social ethics.
7) global problems of Environment, U.N., Law of the Sea Conference, etc

Crossing and intersecting with these themes will be such environmental concerns as energy and resource management, land-use, various aspects of environmental pollution, technology assessment and environmental impact studies.

Course Format

Those unfamiliar with modular programming should read the explanation on pages 10-11.

Instructor:

Contributing to these courses is the responsibility of all the staff in the Science and Human Affairs Programme, as well as outside people who contract to participate as advisors and seminar leaders. The overall coordinator is George Bindon.

Below are descriptions of some of the seminars offered in this course last year:

ENVIRONMENTAL ISSUES

Instructor: Fred Knelman

Content: This will be a seminar in which the basic orienting concepts and issues of environment will be discussed. In particular the concepts of ecology, applied largely to social systems, will be the center of discussion. To a large degree each discussion will follow the basic issues outlined in the course description for Interdisciplinary Studies. N-221-2 and N-222.4.

Requirements: Attendance and involvement. Students will be judged on their level of preparation and inputs. It would be expected that each student would make one major contribution during the seminar period in the form of a written document and/or leading a discussion on a prepared topic.

PERCEPTION OF ENVIRONMENT

Instructor: Steve Rosenbloom

Content: This seminar is designed to investigate some of the issues currently confronting social scientists attempting to study the physical and socio-psychological environments of man. The focus will be on the urban environment and problems of an architectural, sociological, geographical, psychological and cultural nature which often make adjustment to city living a difficult task. Topics which will be included are: (A) Methodology - How do social scientists go about studying the physical-social environment? (B) An examination of the research on some of the concepts associated with the environment, eg. territoriality, personal space, environmentally induced stress. (C) A focus on the influence of man-made environments on human behavior. (D) A distinction between the behavior of urban and rural inhabitants as a product of their differential life-styles. (E) Behavior in restricted environments, eg. prisons, mental institutions, space flights.

NUCLEAR ENERGY AND PUBLIC INFORMATION

Instructor: Gordon Edwards

Content: (1) The participants will examine the implications of large scale development of nuclear generating capability on questions of public safety, environmental impacts, energy resource development patterns, population and growth. (2) The problems of disseminating effectively to the public, balanced information on the scientific, technological, environmental social and political implications of nuclear development will be examined. (3) Seminar participants will be involved in a practical exercise in public information by contributing to the production of several issues of the environmental journal Survival.

ECOLOGY AND LITERATURE

Instructor: Mona Adilman

Content: This seminar will examine ecological themes in literature. Examples of poetry and prose will be analyzed for their ecological content eg.attitudes toward nature, alienation, the values of diversity and communion with nature, comparative religious responses to nature, etc. Students will be encouraged to attempt to produce some creative written expression involving an ecological theme.

NUCLEAR ISSUES AND ENERGY POLICY RESEARCH SEMINAR

Instructors: Fred Knelman and David McCallum

Content: In this tutorial various aspects of nuclear technology will be discussed. The implications of large scale development of nuclear generating capability on questions of public safety, environmental impacts, energy resource development patterns, population and growth will be examined. There will be an initial general orientation to nuclear issues after which students will select a specific research task concentrating on a given body of resource material.

ENVIRONMENTAL AND OCCUPATIONAL HEALTH

Instructors: Fred Knelman and Barry Sookman

Content: It is estimated that 80 to 90% of all cancer is environmentally induced. Does the public really understand what this means? The social, economic and physical costs of this disease will be discussed at length, as will methods of prevention, environmental standards, public education, government policy and civil liberties.

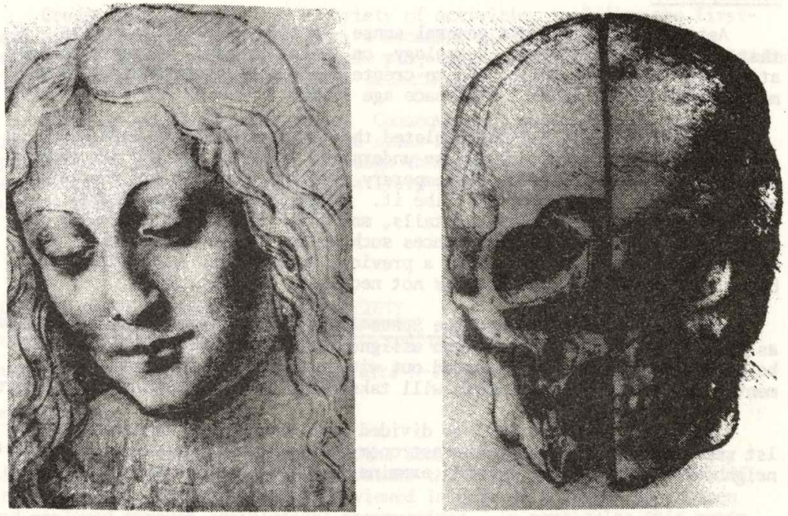
Requirements: This seminar will meet for the first few weeks, after which it will meet once a month. Students will be encouraged to work out a research topic with the instructor with whom they may wish to meet with privately during the interim. Research areas are varied and a suitable one will be worked out with each student according to his/her particular background and interests.

ENVIRONMENTAL ISSUES AND THE MEDIA

Instructor: Michael Bryans

Content: We will look at what happens to information between its source and its eventual exposure and use in various media. The bias and values prevalent in the popular media and why they exist, will be discussed. Critical investigative research and reporting will be examined as an important alternative.

Requirements: Those participating in the seminar will undertake a critical investigation on an environmental problem. Reading and seminar participation will also count toward the final grade.



CASE HISTORIES IN EXPERIMENTAL SCIENCE

Interdisciplinary Studies N-312 - 6 credits

Description:

Readings will concentrate on the original scientific texts (e.g. Harvey, Galileo, Newton, Faraday, Pasteur, Crick and Watson). In the laboratory section, students will follow the original experimental procedures which will also be examined in classroom demonstrations on film and on videotape. **Not offered in 1976-77.

ASTRONOMY, COSMOLOGY AND THE SPACE AGE

Interdisciplinary Studies N-351 - 6 credits

Description:

Astronomy, in its most general sense, is the study of the bodies that make up the universe. Cosmology, on the other hand, attempts to look at the universe as a whole, and to create a model or picture of it which makes sense in our minds. The space age is NOW.

Our aim is that, having completed this course, you will have an appreciation of the universe as we understand it today, of the discoveries and ideas which have led to contemporary theories about it and the terms and techniques by which we describe it. Emphasis will be on general concepts rather than specific details, and while it will be necessary to refer occasionally to other sciences such as physics or mathematics, this will be kept to a minimum. Thus a previous acquaintance with science may be an advantage, but certainly is not necessary to this course.

Astronomy, Cosmology and the Space Age will be presented essentially as a lecture course. There is no assigned textbook: the essentials will be presented in class and rounded out with a variety of handouts, assignments, and special events which will take place outside regular class hours.

The course material will be divided into two parts. Lectures in the 1st semester will deal with the astronomy of the solar system, our local neighbourhood in space. We will examine it both as a system, arising from a common origin and bounded by a common set of laws; and as a number of discrete bodies - sun, moon, planets, etc. - each with its own characteristics.

Since the solar system was almost the exclusive concern of astronomers from the beginnings of history until the last century, and since even the telescope is a comparatively late invention, first-term lectures will be supplemented by a set of observing assignments. These will be exercises in naked-eye observation which will help students to know their way around in the sky, and familiarize them with charts and methods of observing and describing phenomena. If possible, several class meetings will be held at the Dow Planetarium, where the Zeiss projector will serve to simulate many celestial phenomena which would be difficult or impossible to see otherwise.

The second semester will be devoted to the greater reaches of space; the universe as it is composed of planets, stars, nebulae, and galaxies. In the last hundred years great advances have been made in understanding how these different entities are related to each other. Since modern astronomical discoveries have only been made possible by the advent of sophisticated equipment and techniques, we will be limited to talking about them. The subject will not remain totally abstract, however, as there is a wide variety of material available in the form of slides, films and periodical literature which will be brought in where appropriate.

Credit will be given for a variety of activities including the first-term assignments mentioned earlier, a December mid-term examination, a second-term paper, group audio-visual projects, and other activities. Grades will be compiled from the student's selection of these options.

There is no final examination. Consequently, while the mid-term will stress general knowledge of the solar system, students will be able to specialize in the second term. Through their choice of term work it will be possible to concentrate on a relatively small part of the second-term subject matter for detailed study.

ADVANCED STUDY IN TECHNOLOGY AND SOCIETY

Interdisciplinary Studies N-401 - 6 credits

Prerequisite: Science and Human Affairs N-201, N-202

Description:

This is an advanced seminar on the social relations of contemporary technology and the issues of human values that have arisen as a result of its emergence. Technology will be viewed largely as a social phenomenon and analyzed through sociological perspectives. In particular this means an examination of the social institutions of technology and their behaviour, the behaviour, attitudes, etc. on the human community involved and the impact on social change and values. The latter theme will orient the issues to a socio-humanistic study.

Some of the topics to be considered are:

1) Social models of technology; how technology affects social changes, the concept of cultural lag, etc.

2) Elaboration of the model in terms of interactions with politics, economics and culture; rates of growth - the notion of exponential growth and its consequences.

3) The problems of technological backlash such as environmental pollution, social stress, invasion of privacy, etc.

4) Detailed analysis of selected technologies:
   - electronic (computer, media, etc.)
   - chemical and biological
   - nuclear

5) Selected issues related to technology:
   - technology transfer and the third world
   - the Green Revolution
   - the energy crisis
   - nuclear proliferation
   - environmental issues, etc.

6) The Canadian scene - selected materials relating to Canadian technology.

7) Technology, culture and values.

Course Requirements:

There will be no exam in this course and the grading will be based on the quality of output by the students. Each student, however, will be required to produce:

a) A major essay on an appropriate theme or a research study and report. Research projects may be developed by small groups of students but the theme of both essays and projects must be cleared with the instructor.

b) Students will be required to read from the recommended book list and whenever motivated to submit a short review. In addition there will be lectures and films to which the students will be directed during the year and short reviews of these would also contribute to the grade.

c) Each student in the seminar will be expected to lead a discussion once during the year on an appropriate subject i.e. their essay or research project or some other topic.

Required Text

F.H. Knelman, ed., 1984 And All That, Wadsworth. (available in the Concordia and Classics bookstores)

Instructor: George Bindon

ADVANCED STUDY IN THE HISTORY OF SCIENCE

Interdisciplinary Studies - History N-446 / N-447 - 6 credits

Dr. Chambers has been on sabbaticalfor the last two years. This year was spent at the Department of History and Philosophy of Science at the University of Melbourne,Australia. Below is a description of a course he taught while there. N-446 is a topic course. The exact description of the topic Dr. Chambers will be dealing with this year and a course description will be available as soon as possible.

TOPIC: "The Social Context of Science"

Content:

The aim of this course is to examine the social function of science, to look at the characteristics of organization and behaviour which distinguish science from other intellectual pursuits, and to discover the social norms and values which guide scientific activity. The technical content of specific sciences is not studied as such; rather science and technology are considered as cultural and economic forces which shape, and are shaped by, the society in which they exist. Some of the topics to be discussed are:

1) What is Science?
2) The Scientific Community: Norms and Values
3) The Professionalisation of Science: specialisation and elitism
4) Neutrality and Objectivity in Science
5) Two Decisions: Making the bomb and using it
6) Science Walks on Two Legs: People's Science in People's China
7) Two Roads: Technocracy and Anarchy
8) Two Cultures: Fragmentation of the Human Vision

Attention is called to the fact that science in twentieth century China will receive special attention, based on Dr. Chambers' travels in the People's Republic in 1974 and 1975.

"The Social Context of Science" (Continued)

Format:

The course is divided into a number of autonomous instructional units. Associated with each unit is an introductory lecture, a tutorial discussion, and a list of readings. Each student will prepare a total of eight of the units. The first five are required of everyone, while the remaining three are selected from a longer list in accordance with the individuals background and interests. Assessment will be by essay examination over the eight units chosen.

Preliminary Reading

John Ziman,	Public Knowledge (Cambridge University Press, 1968 Paperback.)
Theodore Roszak,	The Making of a Counter Culture (Anchor, 1969 Paperback.)
R. Pirsig,	Zen and the Art of Motorcycle Maintenance (Bantam Books, 1975) Paperback.
Science for the People,	China: Science Walks on Two Legs. A Report from SCIENCE FOR THE PEOPLE. (Avon Book, 1974 Paperback.)

Instructor: David Wade Chambers

SCIENCE AND PUBLIC POLICY

Science and Human Affairs N-472 - 6 credits

Prerequisite: Science and Human Affairs N-201 and N-202, course in Political Science or permission of the instructor.

Description:

Most major issues faced by the contemporary polity can be seen, to a great extent, to be the consequence of the rise of science and technology. The need to understand the relationships between science technology and the political dimensions of society, has become an area of increasing concern of scholars, governments and citizens.

Course Requirements:

This is a seminar course. Students will do common readings and are expected to be prepared to discuss them in class. Additional assignments and a final paper or presentation on an aspect of science and public policy are required.

Science and Public Policy: Some Topics

Science and technology briefly examined as a primary force shaping contemporary society and politics.

Big Science versus Little Science

Impact of technology on the economic system and some responses.

Invention, Innovation and Technological Change.

Science, technology and developing countries.

Science and technology in China.

Military science; technology and government.

Political activism among scientists.

Technology assessment and forecasting - pros and cons.

Comparative science policy (i.e.) U.S.A., Australia, Europe, Russia.

Knowledge and power.

Transfer of scientific and technological information and processes; its costs and political implications.

The history, rationale, structure and function of the several governmental institutions dealing with science policy: Science Council of Canada; Lamontagnes Senate Committee; Ministry of State for Science and Technology; National Research Council.

Federal-Provincial aspects of science policy, government research policy and research in the universities.

"Alternative" technology, "non-destructive" technology, "liberatory" technology - some hopeful futures.

SEMINAR IN SCIENCE AND HUMAN AFFAIRS

Interdisciplinary Studies N-493 - 6 credits
N-494

Description:

The new course Seminar in Science and Human Affairs is described in the calendar as follows:

> Primarily designed for third year major students in Science and Human Affairs. Taught by all members of staff, this seminar affords an opportunity for more intensive examination of an explicitly interdisciplinary theme.

Those enrolled in the course will be interviewed by members of the staff to identify the students' strengths and weakness in areas covered by the Science and Human Affairs Programme. If the student has plans for graduate study in History of Science, Science and Public Policy, or Environmental Studies, a regimen of reading and research shall be devised in consultation with the appropriate staff person or persons in the department. The aim will be to assure that the student graduates with a sufficient background in the area.

SEMINAR IN SCIENCE AND HUMAN AFFAIRS (continued)

For those students with a more general orientation, a specific topic or case study will be chosen in consultation with the staff, and a major paper presented in the second term.

Instructor: Staff

BELOW ARE COURSES OFFERED BY OTHER DEPARTMENTS AT CONCORDIA THAT CAN BE SUPPORTIVE OF INDIVIDUAL PROGRAMMES IN SCIENCE AND HUMAN AFFAIRS.

ECONOMICS

CANADIAN ECONOMIC POLICY I

Economics N-304/2 - 3 credits

Prerequisites: Economics N-209 and N-210

Description:

Public policy for individual sectors of the economy. The course is principally a study of market power and the ways by which it can be controlled with special attention paid to anti-combines policy and the particular problems posed by the multinational corporation. Other topics discussed include policies for agriculture, transportation, and regional development.

TEXTS:

A. Breton, Discriminatory Government Policies in Federal Countries

Canadian Perspectives in Economic Series, Articles D8, F2, F3, H1, H4

L. Officer and L. Smith, Issues in Canadian Economics

A.E. Safarian, The Performance of Foreign Owned Firms in Canada

M. Armstrong, The Canadian Economy and Its Problems

Instructors:

Day: M. Armstrong Evening: To be announced

CANADIAN ECONOMIC POLICY II

(Economics N-305 /4 - 3 credits)

Prerequisites: Economics N-209 and N-210

Description:

Policies for stabilization and growth. Monetary and fiscal policies are examined as solutions to the problems of unemployment and inflation to which special attention is given. Price and income control and economic planning are studied as complementary or alternative approaches to full employment and price stability. Discussion on techniques of economic growth in developed countries precedes an examination of the validity of the 'growth ethic'. Emphasis is placed on Canadian economic problems, institutions, and policies.

TEXTS:

K.E. Boulding, Principles of Economic Policy

B.J. Cohen, Balance of Payments

Ian Drummond, The Canadian Economy

L. Officer and L. Smith, Issues in Canadian Economics

W. Peterson, Principles of Economics, Macro

M. Armstrong, The Canadian Economy and Its Problems

Instructors:

Day: M. Armstrong Evening: To be announced

ECONOMICS OF THE ENVIRONMENT

(Economics N-307/2 AA - 3 credits)

Prerequisites: Economics N-209 and N-210

Description:

The subject of this course is environmental quality. This requires an analysis of the relationships between the natural environment, economics, and institutions. The objective is to depict the problem of environmental quality as an economic problem whose solution demands major changes in economic, political, and legal institutions. Attention is also given to policies of collective environmental actions in which the effective management of common property resources will be discussed. The course concludes with a discussion of some broader issues such as the consistency of improved environmental quality with continued economic growth and population growth.

ECONOMICS OF THE ENVIRONMENT (Continued)

(Economics N-307/2 AA - 3 credits)

TEXTS:

G.T.J. Miller, Replenish the Earth

J.J. Seneca and M.K. Taussig, Environmental Economics

Instructor: F. Muller

ECONOMICS OF NATURAL RESOURCES

(Economics N-308/4 AA - 3 credits)

Prerequisites: Economics N-209 and N-210

Description:

This course focuses on the problems of finiteness of the natural resources base in Canada and in the world, analysis of the demand for and supply of natural resources and energy, and discusses the economic aspects of a selected group of conservation measures (financial incentives,re-allocation of property rights, regulation).

TEXTS:

A. Scott, Natural Resources

Instructor: J. Breslaw

GEOGRAPHY

EARLY MAN

Interdisciplinary Studies N-212 (212) 6 credits

Prerequisite: Geography N-211, or 2nd year standing in honours or departmental major programme in a Social Science

Description:

An examination of the scientific evidence for the unwritten part of man's evolutionary history. The course will study both food-gathering man and food-producing man. The roles of the biological and cultural components will be considered as well as the factor of environment.

TEXTS: TBA

Assignments & Grading: TBA

RESOURCE UTILIZATION AND CONSERVATION

Geography N357 (457) - 6 credits)

Prerequisite: Geography N-211 or second year standing in an honours or departmental major programme in a social science or the Faculty of Commerce.

Description:

The resource concept and concepts of conservation. The regional approach to resource management. Case studies of the problems in developing particular natural resources and of interstate areas of poor economic health, with emphasis on the regional and natural parts of such developments. Special emphasis will be given to Canadian problems and those of selected underdeveloped countries.

TEXTS: DASMANU, Raymond, "Environmental Conservation".

Assignments & Grading: T.B.A.

HISTORY

ENLIGHTENMENT AND REVOLUTION, 1640-1848

History N-333 (415) - 6 credits

Prerequisite: History N-210

Description:

European history in the age of the French Revolution, including a study of the scientific and industrial revolutions.

TEXTS: T.B.A.

Assignments & Grading: T.B.A.

Instructor: L. Rothkrug

SOCIAL AND INTELLECTUAL HISTORY OF EARLY MODERN EUROPE

History N-335 (442) - 6 credits

Prerequisite: History N-210

SOCIAL AND INTELLECTUAL HISTORY OF EARLY MODERN EUROPE (continued)

History N-335 (442) - 6 credits

Description:

A study of change and continuity in European society and culture, 1300-1650. Problems studied include Feudal-Capitalist Relationships the Italian Renaissance, Northern State Development, Protestant Reformation, Scientific Revolution and European Colonial expansion. Methodological issues will be emphasized.

TEXTS: T.B.A.

Instructor: T.B.A.

SOCIAL AND INTELLECTUAL HISTORY OF MODERN EUROPE

History N-336 (444) - 6 credits

Prerequisite: History N-210

Description:

The intellectual systems arising in Europe since the 17th century will be explored in the context of the economic and social circumstances which engendered them. This course will begin with the rise of theories of "possessive individualism" and will end with the contemporary cultural crisis. While attention will be paid to the general dynamics of culture, special attention will be devoted to the social functions of particular ideologies.

TEXTS: T.B.A.

Instructor: T.B.A.

ADVANCED STUDY IN THE HISTORY OF SCIENCE

(History- Science and Human Affairs N-446 (446) - 6 credits)

Prerequisite: Permission of the Department

Description:

Seminar in a selected topic in the History of Science. The emphasis will be on encouraging students to conduct historical investigation on their own under a professor's guidance. The specific content will vary from year to year depending on the instructor.

Instructor: T.B.A.

ADVANCED STUDY IN THE HISTORY OF SCIENCE

(History - Science and Human Affairs N-447 (447)) - 6 credits

Prerequisite: Permission of the Department

Note: A student repeating History-Science and Human Affairs N-446 registers for credits under History - Science and Human Affairs N-447.

PHILOSOPHY

INTRODUCTION TO LOGIC AND PHILOSOPHY OF SCIENCE

(Philosophy N221/3 - 6 credits)

Description:

General problems of correct reasoning and its linguistic articulations will be studied. We shall also learn some elementary methods of deductive logic and analyse their role in scientific thinking in general.

Evaluations:

Students are expected to make use of conferences and pass successfully four in-class examinations. There will be no papers and no final examination.

Texts:

Baum, Robert,	Logic
Baum, Robert,	Workbook to Accompany Logic
Hempel, Carl,	Philosophy of Natural Science

Instructor: V. Zeman

MODERN LOGIC

(Philosophy N321/3 XX - 6 credits)

Description:

A study of sentential and predicate logic (with identity and descriptions). The emphasis is mainly on the development of natural deduction rules and their application to arguments. Some elementary model-theoretic concepts will be discussed and a completeness proof for predicate logic will be sketched.

Evaluation: 3 class tests worth 30% each and home work worth 10%

MODERN LOGIC (continued)

Texts:

Kalish & Montague, Logic: Techniques of Formal Reasoning
Quine, Philosophy of Logic

PHILOSOPHY OF THE SOCIAL SCIENCES

(Philosophy N-376 (435) - 3 credits)

**NOT GIVEN IN 1976-77

Philosophical examination of the structure and methodology of the social sciences. Special attention to problems of functionalism, teleological explanation and the testing of social theories.

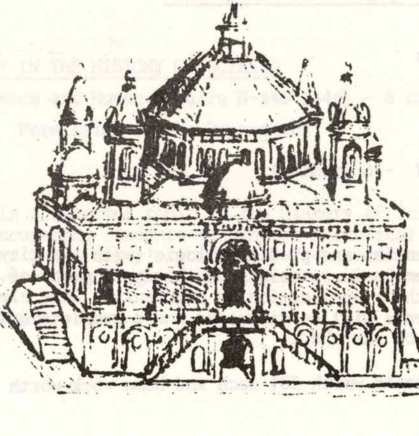
THE PHILOSOPHY OF SCIENCE ***NOT GIVEN IN 1976-77

(Philosophy N-421 (452) - 6 credits)

Prerequisite: One course in logic or permission of the Department

Description:

A critical examination of problems pertaining to the structure and status of scientific theories and the logic of scientific inference. Such topics as the following will be discussed: explanation, confirmation, verifiability and falsifiability, problems of definition, observational and theoretical terms, models and analogies.



INTRODUCTION TO GENERAL SYSTEMS THEORY

Philosophy N495/3AA

Description:

This course introduces the student to General Systems Theory as a philosophical perspective without presupposing any specific background in mathematics or logic. GST has been defined as "the science that is common to all large collections of interacting functional units that are combined to achieve purposeful behavior". It attempts to integrate contributions from diverse disciplines by uncovering structural isomorphisms, i.e. by abstracting from the qualitative nature of interactions and by focusing on their formal structure.

It is a basic assumption of this course that many important problems faced by society today involve increasingly complex, i.e. large and richly connected systems and that the methodological tools supplied by GST could be more successful in tackling these problems than the piecemeal approach of traditional methodology.

Although various specific systems will be studied for illustrative purposes the main objective of the course is to acquaint the student with GST as a very general conceptual scheme and an associated body of principles which govern an amazingly vast hierarchy of systems.

In particular, such basic and highly "transportable" concepts as i.e. structure, organization, feedback, complexity, information, purposiveness, will be explored and a teleological framework suited for the social and behavioral sciences developed.

Texts: To Be Announced

Instructor: Franz Oppacher

POLITICAL SCIENCE

GOVERNMENT AND POLITICS OF CANADA

Political Science N330/3 A - 6 credits

No prerequisite

Description:

This is a basic comprehensive and intensive introduction to Canadian government and politics. It is primarily about the machinery of government in Canada. It concerns itself also with the political behaviour of Canadians and the formal institutions by which political aims are realized. It is important to explain and describe how politicians function in their natural habitat, which is Parliament, the Cabinet, and the institutions related to them, and how they get there.

An understanding of the constitutional and political arrangements which govern how power is exercised is essential if one is to understand how a country came to exist and the style of its politics. In Canada, which has enjoyed no revolutionary change in about two centuries as an organized political community, almost every institution of government has deep roots in the past. Thus we shall study some of the highlights of our constitutional and political history. Much is adapted from other countries, particularly Great Britain and the U.S.A., leading us to many references to those systems.

The course is intended to cover the whole range of Canadian government and politics, though naturally it will not do so at equal length and detail every year for each topic on the syllabus. Students should note that there are three complementary half-courses in Canadian Federalism (P.S. N436*), Canadian External Affairs (P.S. N437*) and Quebec Politics (P.S. N335*) which students who pass this course are eligible to take.

TEXTS:

The text is R. MacGregor Dawson, The Government of Canada, 5th edition, revised by Norman Ward, 1970. An excellent supplement to it is Politics: Canada, Culture and Process, a paperback edited by Paul Fox, 3rd edition, 1970.

For those students who have never taken a course in comparative government (e.g. P.S. N240) it is recommended that they get a copy of R.A. Khan, S.A. MacKown and J.D. McNiven, An Introduction to Political Science (Irwin - Dorsey, 1972) and refer to it for the comparisons we shall make, particularly to Great Britain and the U.S.A., all through the course. For those who feel they need some refreshing in Canadian history the best sources for our purposes are: A.R.M. Lower, Colony to Nation and/or R. Cook, J.T. Saywell and J.C. Ricker, Canada: A Modern Study (Clark, Irwin Canadian Paperback CI 16)

Instructor: H.M. Angell

PROBLEMS OF PUBLIC ADMINISTRATION

Political Science N-333/3 AA - 6 credits

Prerequisite: Political Science N-240 or N-330

Description:

A course which is designed to further the study of the administrative aspects of government. Emphasis will inter alia be on the public service, theories of administration, public personnel policies, budgets, comparative administration, public relations.

Texts:

Kernaghan, Willms: Public Administration in Canada
Kernaghan, Willms: Bureaucracy in Canadian Government
Golembiewski, White: Cases in Public Management
Hodgetts: The Canadian Public Service

Reports:

Preparation of one case study in Public Administration or similar assignment in consultation with instructor.

Topic Outline: (assigned readings available at a later date)

Theory and Concepts in Public Administration

Public Administration and Public Service in Canada

Problems of Management

Organisation, Public Personnel, Finance

Instructor: K.J. Hermann

SCIENCE AND PUBLIC POLICY

Interdisciplinary Studies N-472 - 6 credits

Prerequisite: Interdisciplinary Studies 201 and 202 or one course in Political Science

For complete description of this course see page 25

RELIGION

MODERN RELIGIOUS AND ATHEISTIC THOUGHT

Religion N443/3 - 6 credits

** Not Offered in 1976/77

Description:

A historical and critical examination of some of the religious and atheistic thinkers who were pivotal for the self-understanding of modern religious man. The course will focus on these thinkers' understanding of the nature of religion and its role in the modern world. The first semester will examine the attempt of 19th century thinkers to find a natural basis for religion. The second semester will continue the earlier theme as well as analyze how selected 20th century religious thinkers began to struggle again with the category of Revelation. Formative thinkers in both the Jewish and Christian traditions will be discussed.

SOCIOLOGY AND ANTHROPOLOGY

SOCIOLOGY OF KNOWLEDGE

Sociology N422/3 (495) - 6 credits

Description:

This course examines the interaction between social structures and meaning and belief systems. Of special concern will be the social influences bearing upon claims to truth and validity and upon definitions of social morality.

Special Focus or Features of Course:

During the 1976-77 academic year this course will especially focus on Mannheim, Scheler and German critical theory.

Work Required of Student Taking Course

Reading the required readings and participate in class discussions. Prepare two take home exams, covering the required readings. Write a research paper on a topic approved by the instructor.

Probable Texts:

Mannheim, Ideology and Utopia

Berger and Luckman, The Social Construction of Reality

Geertz, "Ideology as a Cultural System"

Kuhn, The Structures of Scientific Revolution

Wolff, From Karl Mannheim

Others will be announced in class.

POPULATION AND SOCIETY ** Not offered in 1976-77

Sociology N-448 (461) - 3 credits

Prerequisite: Sociology N-210, or an introductory course in a social science.

Description:

This course consists of a brief survey of population theory and an introduction to the techniques of population analysis. It will cover the size, distribution, and composition of the population; changes in these characteristics; the relationship between population trends and social and economic conditions, with special reference to recent trends.

INTRODUCTION TO ARCHAEOLOGY

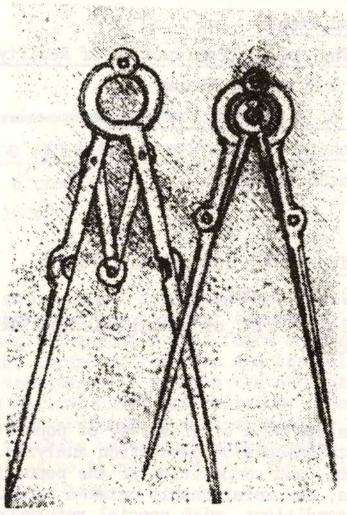
Interdisciplinary Studies/Anthropology N-333 - 6 credits

Description:

An introduction to the archaeology of the ancient civilization of the Mediterranean World. Special emphasis will be given to the methodological approach to archaeology.

Note: Students who have credits for Archaeology N-211 or
Interdisciplinary Studies/Anthropology N-331 (211) or
Interdisciplinary Studies/Anthropology N-332 (212)
may not take this course for credits.

Instructor: Aida Arif



HUMAN RESOURCES

The Science and Human Affairs Programme considers an important part of its role in the university and the community to encourage discussion and interest in the social impact of science and technology. During the past few years we have brought to the campus many creative and distinguished people. This has made for a particularly invigorating intellectual climate within the programme and has offered our students exposure to an unusual richness of human resources.

The following is a list of some of the people who have visited and contributed to the Science and Human Affairs Programme over the last few years.

Lewis Auerbach

Project officer, Ontario Educational Communications Authority. On secondment to the Science Council of Canada.
Lewis is a Departmental Associate of Science and Human Affairs. He spent one week contributing to seminars during the 1974 winter term. In 1975 he presented a paper here on Technology and Aging based on research he is doing for the Population Study at the Science Council.

Dr. Morrel P. Bachynski

President of SCITEC (the Association of the Scientific, Engineering and Technological Community of Canada). Director of Research, RCA Limited. In 1975 Dr. Bachynski gave a lecture on Science Policy that included a critical review of the effectiveness of the Ministry of State for Science and Technology and the Science Council.

Jack Basuk

Secretary of the Science Council of Canada. We have had close relations and cooperation with Mr. Basuk leading to a lecture series held at Concordia, in 1974-75 on the Social Impact of Science and Technology.

Dr. Aurele Beaulnes

Secretaire du Ministere d'Etat Science et Technologie, Ottawa. Dr. Beaulnes was a keynote speaker during one of the sessions of the 1973 conference organized by Science and Human Affairs on Research and the Universities.

Robert Beck

Chargé de recherches, Centre de Recherches, et d'Innovation Urbaines, Université de Montréal. Long-term Planning Consultant, Dawson College. User Analysis Consultant to architects and educational institutions. Dr. Beck was instrumental in forming a team research proposal within Science and Human Affairs on Institutional Perception of the Environment.

Branco Belovic

Director-General, Information Services, Department of the Environment. Previously a Science Adviser for the Science Council of Canada. Professor Knelman has been active as a consultant for Mr. Belovic at Government Canada. Mr. Belovic facilitated a grant in support of a Concordia lecture series in 1973 on Research Policy and has visited the programme regularly to give lectures and lead seminars.

George C. Benello

Former Co-director of the Cambridge Institute's New City Project and Professor of Sociology and Urban Studies at Goddard College.
Co-editor of Radical Democracy: Essays on the Theory and Practice of Democratic Participation (Grossman 1970), and an editor of Our Generation. Mr. Benello contributed to a series of discussions considering the Conserver Society Study. He also tutored several students and offered a seminar.

Dr. A. Clark Blackwood

Dean, Faculty of Agriculture and Vice-Principal, Macdonald College. Professor of Microbiology.
Dean Blackwood was a panel member in the Research and the Universities conference series.

Louis-Philippe Bonneau

Vice-recteur de l'Université Laval. Co-author, Quest for the Optimum. Keynote speaker during one of the sessions of Research and the Universities conference.

Dr. Lionel Boulet

Directeur, Institut de Recherches de L'Hydro-Québec.
Chairman, Science Policy Council, Quebec.
Panel member during one of the Research and the Universities conference series.

John Bradford

Consultant, Office of the Science Advisor, Environment Canada. Open Water Whale Research, with Dr. Paul Spong for Project Jonah. Member, Greenpeace. Active in the creation of Rochdale College, Toronto.
Members of the Science and Human Affairs Programme worked with Mr. Bradford in organizing a number of benefit "Whale Shows" in support of the Greenpeace Foundation. He was also one of the original participants in the Canadian Coalition for Nuclear Responsibility.

Dr. David B. Brooks

Director, Office of Energy Conservation, Department of Energy, Mines and Resources.
This office has close relations with Professor Knelman and made a valuable Background Study #33, Science Council of Canada. Dr. Brooks contributed a talk on Energy Conservation to the lecture series on Social Impact of Science and Technology.

Dr. Maurice Brossard

Vice-recteur a l'enseignement et a la recherche. Université du Québec à Montréal.
Panel member for one of the Research and the Universities conference series.

Peter Charsley

Systems Modelling Consultant, Datacap Limited.
His firm organized the international conference, "Technology and Growth" held at the Conference Centre in Ottawa, February 1975.
Seven students from our department were allowed to attend the conference and take part in its organization. Mr. Charsley also participated in a seminar on technology assessment in the department.

Dr. Gilles G. Cloutier

Directeur de Recherche, Institut de Recherche de l'Hydro-Quebéc.

Dr. Arthur J. Cordell

Author, Science Council Background Study No. 22, The Multinational Firm, Foreign Direct Investment and Canadian Science Policy. He is also a science advisor for the Science Council.

Mr. Cordell is chairman of an interdepartmental committee on the Conserver Society project funded by the Department of Supply and Services. He has given two lectures at Concordia: "The Conserver Society" and "The Structure and Function of Government Laboratories and the Transfer of Technology to Manufacturing Industry".

Professor Knelman did two investigatory essays as a contribution to this study.

Lawrence Day

Staff Supervisor of a Business Planning Group at Bell Canada, Montreal. Specialist on technology assessment

Mr. Day gave a seminar series on technology assessment in the joint introductory course given by Science and Human Affairs and Social Aspects of Engineering.

Dr. Virginia Douglas

Past President SCITEC. Professor of Psychology at McGill University.

Chairperson and discussant during a session of the Research and the Universities conference series.

Dr. Frank S. Eadie

Vice President Research, Bell Northern Research.

Panel member during one of the sessions of the Research and the Universities conference series.

Dr. Gordon Edwards

Editor of international ecology newspaper: Survival.
Assistant Director of a Study of the Mathematical Sciences

in Canada, sponsored by the Science Council of Canada. Founding member of the Canadian Coalition for Nuclear Responsibility.

Dr. Edwards initiated a new course which dealt with the social aspects of science and technology for the new Masters in Teaching Chemistry at Concordia. He contributed a lecture to the Social Impact of Science and Technology lecture series on "The Mathematical Ecosystem". He is now leading a seminar on Nuclear Information for the introductory course.

Aurdio Elevazo

Regional Field Director, CUSO Asia.

Mr. Aurdio visited the department to initiate a twinning of Science and Human Affairs with an Asian Academic Programme.

Norman Epstein

Professor of Chemical Engineering at U.B.C.

Professor Epstein is one of the prime movers in a course "Technology and Society" at U.B.C. as well as planning for interdisciplinary studies. He has drawn heavily on our modular resources and also invited Professor Knelman to give the opening week of lectures in Technology and Society (September 1973).

Dr. Henri Favré

Professeur, titulaire de chimie et doyen de la Faculté des études Supérieures, Université de Montréal.

Panel member during one of the sessions of the Research and the Universities conference series. He wrote an article on the proceedings.

Buckminster Fuller

When visiting Sir George Williams Campus during 1973 Mr. Fuller participated in an open discussion on his ideas, which took place in our department.

Dr. William Henry Gauvin

Director of Research and Development, Noranda Research Centre. Senior Research Associate, Department of Chemical Engineering, McGill University. Member of the Science Council of Canada.

Dr. Jean-Claude Guédon

Assistant Professor, Institut d'Histoire et de Sociopolitique des Sciencies, Université de Montréal. Ph.D., University of Wisconsin. Authority on 17th to 19th century scientific community in France, especially chemistry. Presently working on emergence of chemical engineering as a distinct profession, and on the role of social needs in bringing about changes in the history of chemistry.

René Hurtubise

Directeur-Général de la Conférence des Recteurs et des Principaux des Universités du Quebec.

Dr. Ray Jackson

Science Adviser, Science Council of Canada.

Dr. Jackson contributed a lecture on "The Goals of Science Policy" during the series on the Social Impact of Science and Technology.

Peter Kerrigan

Environmental consultant and graduate of Faculty of Environmental Studies of York University.

Mr. Kerrigan has had a close relationship with our department for about 5 or 6 years.

He was a member of a research team in our department seeking a grant for research into institutional perception of environment.

Maurice Lamontagne

Member of the Canadian Senate. Chairman of the Senate Special Committee on Science Policy. Former Secretary of State and Register General of Canada.

Keynote speaker during one of the sessions of the Research and the Universities conference series.

Ron Levy

Professor of Environmental Design, University of Montreal.

Professor Levy visited the department several times with a view to seeking cooperation between our departments. The Design Council of Canada held a 2-day conference on the 25th and 26th of August 1975 to which Professor Knelman was invited to contribute.

Dr. Derek Maasland

Science Advisor, Science Council of Canada. Spent two years on secondment to the Organization for Economic Co-operation and Development (OECD), Head, Water Management Sector.

Dr. Maasland gave a lecture on "Canadian Energy Opportunities" during the series on The Social Impact of Science and Technology.

Dr. James MacLachlan

Ph.D. from the University of Toronto, Assistant Professor Institute for the History and Philosophy of Science and Technology, University of Toronto.

Dr. MacLachlan is an authority on Galileo, Mersenne, and, in general, on 17th and 18th Century physical sciences. He has repeated some of Galileo's experiments in an effort to resolve controversy regarding the alleged impossibility of those experiments. More recently, he has directed a large-scale project attempting to use computer methods in analyzing the growth of 18th Century British science and technology.

During his visit to our Programme he discussed problems of curriculum, gave a presentation on his quantitative work and offered a lecture and demonstration for the Case Histories in Experimental Science course.

Reverend Gregory MacLeod

Associate Professor of Philosophy, College of Cape Breton, Sydney Nova Scotia.

This college is evolving into the University of Cape Breton in cooperation with the Nova Scotia Institute of Technology. A planning group visited Science and Human Affairs for a week to study our program. They purchased a full set of our modular teaching materials. Professor Knelman was also invited to Cape Breton to lecture and assist in their plans.

Dr. P.D. McTaggart-Cowan

Executive Director, Science Council of Canada. Past President, Simon Fraser University.

Dr. McTaggart-Cowan was a key note speaker for one of the sessions of the Research and the Universities conference series and has encouraged and assisted the creation of a mutually satisfying relationship between the Science and Human Affairs Programme and the Science Council of Canada.

Dr. William Meggs

Research Associate, Department of Physics, McGill University. Dr. Meggs worked for several years in the modular courses and offered seminars on a number of topics.

Judith Merrill

Author, editor, critic, and lecturer. The following are some of her works:

Fiction: Daughters of the Earth (three novels)
Shadow on the Hearth (novel)
The Tomorrow People (novel)
Gunner Cade (novel)

Non-Fiction:
"Fritz Leiber (Profile)"
"Theodore Sturgeon"

Ms. Merril has edited over twenty Science Fiction anthologies. She has visited the programme several times and has led seminars.

Jerry Miedzinski

Science Advisor to the Science Council of Canada. A founding member of the Canadian Association for the Club of Rome.

Mr. Miedzinski gave a lecture on "The Influence of Science Policy on Health and Health Services".

Dr. M. McGregor

Vice-principal, Health Centre, McGill University. Panel member during one of the sessions of the Research and the Universities conference series.

Mr.Jim Mullin

Deputy Executive Director, Science Council of Canada, responsible for internal operations and future planning.

He assisted the Science and Human Affairs Programme in organizing the conference on Research in the Universities and gave the opening lecture on the "Science Council of Canada, An Overview Of Its Origins And Programme" for the Social Impact of Science and Technology series.

Dr. Naidu Baliah

Associate Professor of Sociology, College of Cape Breton, Sydney, Nova Scotia. Dr. Naidu spent one week with a planning group from the Nova Scotia Institute of Technology studying the Science and Human Affairs Programme. It was the hope of the planning committee to have all the new institution's programmes deal with the Social Impact of Science and Technology. A complete set of the reading modules developed by Science and Human Affairs was purchased by Cape Breton college.

Dr. Edouard Pagé

President, Commision de la Recherche Universitaire.

Bob Pallen

Assistant Dean of Loyola Campus, Concordia University.
Professor Pallen and Professor Knelman developed two interdisciplinary environmental courses at Loyola. Science and Human Affairs coordinates one of the courses at present.

Mr. A.E. Pallister

Vice-Chairman, Science Council of Canada. President, Pallister Resource Management Limited, Calgary.

Derek J. De Solla Price

Author of *Little Science, Big Science*. Dr. Price visited the department and gave a seminar on the development of the area of "Humanities of Science" - a term he coined.

Dr. Lewis Pyenson

Assistant Professor, Institute d'Histoire et de Sociopolitique des Sciences, Université de Montréal. Ph.D., John Hopkins University. Authority on late 19th and early 20th century physics, especially Einstein. Presently working on the social background of German scientists in his period of interest. Editor of *Historical Studies in the Physical Sciences.*

Dr. Karl Raab

Research Chairman, Society to Overcome Pollution. Dawson College teacher of Chemistry.
Dr. Raab has been a regular contributer to the programme over the years and has also been a Departmental Associate.

Siad Rasekh

Mr. Rasekh is an architect and has given seminars in conjunction with the introductory course entitled "Technology and the Urban Environment", for the past two years.

Steven Rosenbloom

Is the Coordinator of Environmental Studies Programme at Vanier College. Member of the Department of Psychology at Vanier College.
Mr. Rosenbloom gives a seminar on Environmental Perception for the modular course and contributed to a team proposal on "Institutional Perception of the Environment".

Dr. Bruce Sinclair

Associate Professor, Institute for the History and Philosophy of Science and Technology, University of Toronto. Authority on history of technology in the U.S. and Canada. Author of a history of the Franklin Institute in Philadelphia and co-author of *Let Us Be Honest and Modest*, (on technology and society in Canadian history). Presently acting director of the I.H.P.S.T.

Dr. O.M. Solandt

Formerly director of the Defense Research Board, Chairman of the Science Council of Canada and recently special special advisor to Ontario Hydro.
Dr. Solandt gave a lecture on "Educating Tomorrow's Engineers to Cooperate with Public Participation in Major Technical Decisions" during the joint Science and Human Affairs and Social Aspects of Engineering conference series entitled *Social Impact of Science and Technology*.

Dr. John Southin

Associate Professor Genetics and Biology, at McGill University. Professor, Universidad de la Habana (La Habana, Cuba). Programme Advisor, Campus-Free College (Arlington, Massachusetts).

Dr. Southin worked with Dr. Wade Chambers in the initial development of the modular teaching programme and was in charge of the McGill component of the course.

Henry Strub

Film Producer, Crawley Films. Mr. Strub was responsible for bringing Buckminster Fuller to Concordia and the Science and Human Affairs Programme.

Eliodor Stoian

Science Advisor, Science Council of Canada. Previously Director and Coordinator of Operations Research; Chief Industrial Models; Chief, Econometrics and Chief, Computer Systems Division at the National Energy Board.

Mr. Stoian gave alecture on "Elements of a National Energy Policy" for the department in 1975.

Nicholas Vincent

Office of Energy Conservation, Department of Energy, Mines and Resources, Ottawa 1972-73. Also the External Affairs Foreign Policy specialist on energy matters. Newsman in South Viet Nam for a period just previous to the fall of the Thieu government.

Mr. Vincent has been a departmental associate for five years and has contributed to the introductory course through a seminar on energy conservation and values.

Roger Voyer

Co-author of "A Technology Assessment System" for the Science Council of Canada. Science Advisor for the Science Council.

Mr. Voyer gave a talk on "Technology Assessment and its Relation to Northern Development" for the Social Impact of Science and Technology series.

Philip Wientrab

Mr. Wientrab is a member of the Business Planning Group at Bell Canada. He was instrumental in organizing the Technology and Growth conference in Ottawa during 1975 and assisted a group of Science and Human Affairs students in attending the conference sessions.

Roger Williams

Senior Lecturer, Department of Government,University of Manchester, U.K. Associated with the Liberal Studies in the Science Programme at Manchester. Author of European Technology: The Politics of Collaboration.

He gave a lecture on "Decision-making in the British Civil Nuclear Power Programmes" during the Social Impact of Science and Technology series.

Andrew H. Wilson

Science Advisor, Science Council of Canada. Author of Background Studies No. 11, Background to Invention and No. 26 Governments and Innovation.

Mr. Wilson delivered a talk on "Science Policy and Industry" during the Social Impact of Science and Technology lecture series.